King County
Department of Development and Environmental Services
900 Oakesdale Avenue Southwest
Renton, Washington 98057-5212
206-296-6600 TTY 206-296-7217

LATERAL DESIGN COMPLIANCE CHECKLIST
2003 IBC - Simplified

Best to print on legal (8 1/2 x 14") paper.

For alternate formats, call 206-296-6600.

LATERAL DESIGN COMPLIANCE CHECKLIST
For Use with the 2003 IBC METHOD 1, SIMPLIFIED
(to be completed with engineer-designed buildings)

Introduction

The lateral design provisions of the 2003 edition of the International Building Code (IBC) differ significantly from previous editions of the Uniform Building Code. Generally, the lack of a prescribed submittal format for required engineering analysis results in varying submittal formats often difficult to interpret. The purpose of this checklist is to provide a tool to review staff to assist in the plan review process to assess compliance with IBC Section 1609 and Section 1615. If the lateral design is based on the simplified method in part or whole, please complete the front and backside of the attached second page and submit it along with the lateral calculations. The Code permits both analytical and simplified approaches for both wind and seismic lateral design. This checklist pertains only to the simplified methods of IBC Section 1609.6 and Section 1617.5. Both are addressed separately. Questions regarding this form should be addressed to Building Plan Review at 206-296-6600.

Simplified Wind Load Design Method: Performance Criteria

IBC Section 1609.6 establishes building and site criteria necessary in order to use the simplified method. These criteria are as follows:

1. The structure is an enclosed building.
2. The building must not have a mean roof height in excess of 60 feet.
3. The roof height cannot exceed the least horizontal dimension of the building.
4. The building cannot be situated on top of a hill or escarpment over 60 feet in height for Exposure B, and 30 feet for exposure C. The maximum average slope does not exceed 10 percent. In addition the hill or escarpment is unobstructed by other topographic features for a distance from the high point of 50 times the height of the hill or 1 mile, whichever is less.
5. The building is a simplified diaphragm building per IBC Section 1609.2
6. The building is not a flexible structure with a fundamental period greater than 1 second.
7. The building has no special joints or separations.
8. The building has regular shape and is approximately symmetrical in cross section and in each direction.
9. Roof slopes do not exceed 45 degrees for gable roofs or 27 degrees for hip roofs.

Simplified Seismic Load Design Method: Performance Criteria

IBC Section 1617.5 allows for the simplified seismic design based on the following formula:

$$V = \frac{1.2 S_{DS}}{R} W$$

IBC Section 1616.6.1 outlines the criteria limiting the use of the simplified method according to the following criteria:

1. Structure is Seismic Use Group I.
2. Building is of light frame construction and does not exceed three stories in height, excluding basements.
3. Buildings of any construction other than light-framed construction, not exceeding two stories in height, excluding basements, with flexible diaphragms at every level as defined in IBC Section 1602.

Alternative use of ASCE 7-02 For Wind and Seismic Load Design:

This worksheet addresses the requirements of the Simplified Method specific to IBC Section 1609.6 and Section 1617.5. Alternatives to the simplified method are contained in ASCE 7-02.

Wind load design IBC section 1609.1.1 provides for structures designed in accordance with the provisions of ASCE 7-02, Section 6. As appropriate, you may choose to use one of the three methods described in ASCE7-02, which are Method 1 – simplified wind load design method procedure, Method 2 – analytical procedure and Method 3 – wind tunnel procedure.

For seismic load design, IBC Section 1614.1 provides for structures designed in accordance with the provisions of ASCE7-02 Sections 9.1 through 9.6, 9.13 and 9.14. Besides the simplified seismic load design method, alternative procedures such as equivalent static lateral force analysis and all types of dynamic response analysis may be used.

If you use the alternative methods for both wind and seismic specified in ASCE 7-02 other than the simplified method described above, this checklist is not required. However, please provide a cover sheet to the calculations detailing which alternate method is used.

IRC Design criteria

1. Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed by this code. The construction of buildings and structures shall result in a system that provides a complete load path capable of transferring all loads from their point of origin through the load-resisting elements to the foundation. R301.1 As an alternative to the requirements in Section R301.1 the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards the design shall comply with the International Building Code.
    1. American Forest and Paper Association (AF&PA) Wood Frame Construction Manual (WFCM).
    2. American Iron and Steel Institute (AISI), Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-family Dwellings (COFS/PM). R301.1.1

2. **Table R301.2(1)** as Adopted for Unincorporated King County. King County Code Title 16.05.040.

CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA FOR KING COUNTY

Ground snow load	Wind speed (mph)	Seismic design category	Subject to damage from				Winter design temp.	Ice-shield required	Flood hazards	Air freezing index	Mean annual temp.
			Weathering	Frost line depth	Termite	Decay					
Varies[1]	85	D1 or D2[2]	Moderate	12" < 1,000ft elev.[3]	Slight to Mod.	Slight to Mod.	25	No	Varies[4]	100 to 250	50

1. The "Snow Load Analysis for Washington" Second Edition (1995), published by the Structural Engineers Association of Washington, shall be used in determining snow load except where the department determines by public rule that a different standard is necessary to protect the public health and safety. The minimum roof snow load shall be 25 pounds per square feet.

2. Seismic design category shall be D1 for areas of unincorporated King County to the east of the Snoqualmie River as it traverses from the King County—Snohomish County line to the city limits of Snoqualmie, east of the town of Snoqualmie, east of the Snoqualmie Parkway and the Echo Lake-Snoqualmie Cut-off SE as they run from the city limits of the town of Snoqualmie to State Highway 18 and to the south or east of State Highway 18. All other portions of unincorporated King County shall be seismic design category D2.

3. The frost line depth shall be considered to be 12 inches for sites up to an elevation of 1000 feet above sea level. For sites over 1,000 feet above sea level a specific site analysis may be required.

4. Flood hazard within King County varies. See the flood hazard code provisions of KCC 21A.24.

Please note:
If you are using this form in conjunction with designing plans for our registered plan program, please be advised that the most conservative design parameters should be used. This is because registers will be used throughout Unincorporated King County rather than at a specific site.

WIND AND SEISMIC LATERAL DESIGN CHECKLIST 2003 IBC

King County Application No. _____ **Engineer/Architect** _____

Seismic Design Performance Criteria Used:

_____ Simplified analysis procedure pursuant to IBC Section 1616.6.1.

_____ Alternate design procedure from ASCE 7-02.

Wind Design Performance Criteria Used:

_____ Building and site meet criteria and simplified method used pursuant to IBC 1609.6.

_____ Alternate design procedure from ASCE 7-02.

Step by Step Procedures Checklist for Seismic Load Design by Method I: Simplified

Step #	Question	Background Information	Answer	Comment
1	Are you using the formula specified in IBC Section 1617.5?	Based on the ultimate base shear formula outlined above in the scoping language, reference IBC Section 1617.5 for details pertaining to the formula values.	☐ Yes ☐ No	
2	What is the design elastic response acceleration used?	The design elastic response acceleration, S_{DS}, for short period as modified with Section 1615.1.3: $S_{DS}=\frac{2}{3}\ Sms$ *where:* $Sms=Fa\ Ss$ per IBC Section 1615.1.2	_____ = S_{DS}	
3	Has the seismic force been determined for each level of the building?	Vertical distribution of seismic forces at each level is calculated pursuant to IBC Section 1617.5.2 using the following formula: $FX = \frac{1.2S_{DS}}{R} Wx$	☐ Yes ☐ No	
4	Are you dividing the ultimate base shear by 1.4 to get the allowable working stress base shear?	Ultimate base shear may be adjusted per IBC Section 1605.3	☐ Yes ☐ No	
5	Have you calculated redundancy factor ρ	Check for redundancy ρ, per IBC Section 1617.2.2.	☐ Yes ☐ No	
Design Loads Please specify the design dead loads used for the building:		Roof = _____ psf Walls/Partitions = _____ psf Floor = _____ psf Flat roofs ≤ 5% slope with ≥ 30 lbs snow load, 20% snow load = _____ psf Storage area: 25% of reduced floor live load = _____ psf Fixed mechanical/permanent equipment = _____ psf		
Shear Wall Type Please specify which type of shear wall is utilized in the lateral design		_____ Segmented _____ Force Transference around openings (requires engineering details) _____ Perforated (requires engineering details)		

Step By Step Procedure Checklist for Wind Load Design by Method I: Simplified

Step #	Question	Background Information	Answer	Comment
1	Have you used the 3-second gust wind speed of 85 MPH in your design?	Basic wind speed for most of King County is 85 mph. per Table R301.2 (1) and IBC Figure 1609.	☐ Yes ☐ No If no, the wind speed used is _____	
2	What is the importance factor, *Iw*, used in your design?	Importance factor, *Iw*, pursuant to IBC Section 1609.5 and Table 1604.5.	_____ = *Iw*	
3	What is the Exposure category used?	Exposure category per IBC Section 1609.4 for all building exposure quadrants. Most of King County utilizes Exposure B with the exception of commercial applications where Exposure C is assumed unless justifying documentation is provided by the engineer to use a different exposure category.	Exposure ☐ B ☐ C ☐ Other (State) _____	
4	What is the mean building height of the building?	Building height per IBC 1609.2	_____ Feet	
5	What is the Exposure Adjustment Coefficient used?	Exposure Adjustment Coefficient (EAC), from IBC Table 1609.6.2.1 (4) based on mean roof height.	_____ = E.A.C.	
6	Has the building been segmented into the specific zones pursuant to the guidelines of IBC Figure 1609.6.2.1?	Based on the main wind force resisting system (MWFRS) and illustrated in IBC Figure 1609.6.2.1, sections of the building are now zoned to receive different wind loading conditions. The MWFRS is comprised of the structural elements that are necessary for the overall stability of the building to resist lateral forces. IBC Section 1609.2 and ASCE 7, Section 6.2 provides formal definitions of what constitutes the MWFRS.	☐ Yes ☐ No	
7A	Using IBC Table 1609.6.2.1 (1), determine the wind design wind pressures used for the horizontal and vertical zones.	IBC Table 1609.6.2.1 (1) specifies the design wind pressures, ps30, for both the transverse and longitudinal directions of the main wind force resisting system for buildings less than 30 feet in height and subject to Exposure B. For buildings over 30 feet in height or in Exposure C , the values from Table 1609.6.2.1.(1) will need to be adjusted based on the formula: Ps=λIwPs30	Horizontal Pressures Zone A _____ Zone B _____ Zone C _____ Zone D _____ Vertical Pressures Zone E _____ Zone F _____ Zone G _____ Zone H _____ Overhang Zone EOH _____ Overhang Zone GOH _____	
7B	Have the design wind pressures been modified due to building height exceeding 30 feet or subject to Exposure C conditions?		☐ Yes ☐ No	
8	Have the wind pressures for the various building zones been applied?	Application of modified design wind pressures to designated building zones as outlined in Steps 6 and 7 above.	☐ Yes ☐ No	

Governing Lateral Force Of Each Building Level and Direction. Please describe below:

Check out the DDES Web site at www.kingcounty.gov/permits